REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Upon entry of this Amendment, claims 1-7 are pending in the application. In response to the Office Action, Applicant respectfully submits that the pending claims define patentable subject matter. By this Amendment, Applicant has amended independent claim 1 to improve clarity.

I. Preliminary Matters

The specification is objected to because the Examiner maintains that "the attempt to incorporate subject matter into this application by reference to Japanese Unexamined Patent Publication Nos. 10(1998)-271374, JP 11(1999)-87922, JP 11(1999)-89553 is improper. In particular, the Examiner maintains that "[t]he references as listed in the specification and the Information Disclosure Statement (IDS) filed July 20, 2000 do not match in that they do not have the same applicant or assignee". By this Amendment, Applicant has amended the specification to indicate that the listed numbers (10(1998)-271374, 11(1999)-87922, 11(1999)-89553) are Japanese Patent Application numbers rather than Japanese Unexamined Patent Publication numbers. Further, Applicant will submit a new IDS with copies of these references as the Examiner suggests. Accordingly, the Examiner is requested to remove the objection to the specification.

The drawings are objected to because the Examiner maintains that the same reference sign "20" is used to designate different solid state radiation detectors in Figures 1A-1C and Figures 6A-6C. Further, the Examiner maintains that the reference signs "L1" (recording light)

and "L2" (reading light) are not shown. Along with this Amendment, Applicant is submitting a Proposed Drawing Correction wherein the reference sign of the solid state radiation detector in Figures 6A-6C is changed to "20d", Figures 1A, 2A, 3A, 4A and 6A are amended to show the reference signs "L1" and "L2". Further, Applicant has amended the specification to reflect the change to Figures 6A-6C. Accordingly, the Examiner is requested to remove the objection to the drawings.

II. Prior Art Rejections

Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai (EP 0898421). Claims 3-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai in view of Nelson et al. (USP 5,508,507, hereinafter "Nelson"). The Examiner maintains that Imai discloses all of the features of independent claim 1 except for a secondary layer including the secondary line electrodes and the main line electrodes arranged in parallel to one another. However, the Examiner asserts that it would have been obvious to have the secondary and main line electrodes alternately arranged in parallel to one another within the device of Imai since it would only involve routine skill in the art to rearrange parts of an invention. Further, the Examiner contends that "one would have been motivated to arrange the electrodes in such a manner based on ease of manufacturing [because] if the main line electrodes were already manufactured with the second electrode, making a main line electrode into a secondary line electrode would in a sense only redefine the use of a main line electrode".

Applicant respectfully submits that the claimed invention would not have been rendered obvious in view of the Imai and Nelson. In particular, Applicant respectfully submits that the Examiner is impermissibly using his knowledge of the present invention, in hindsight, to conclude that one skilled in the art would have found it obvious to modify the device of Imai to produce the claimed invention.

It is well settled that an Examiner is prohibited from using his knowledge of the present invention, in hindsight, to establish a *prima facie* case of obviousness. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggest the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Moreover, the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient to establish a *prima facie* case of obviousness. (See *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993); and *Al-Site Corp. v. VSI Int'l Inc.*, 50 USPQ2d 1161 (Fed. Cir. 1999)).

The present invention is based a novel idea of increasing the quantity of signal charge that can be fetched from a detector by making the quantity of light transmitted through the secondary line electrodes smaller than the quantity of light transmitted through the main line electrodes. In order to achieve this result, the solid state radiation detector 20 of the present invention is formed by stacking a first electrode layer 21, a recording photoconductive layer 22, a charge transfer layer 23, a reading photoconductive layer 24, and a second electrode layer 26 having a stripe electrode 26 consisting of main elements 26a, in the recited order. A large number of secondary elements 27a, for outputting an electrical signal which has a level proportional to a quantity of

latent image charge stored in a charge storage portion 29 formed in the interface between the recording photoconductive layer 22 and the charge transfer layer 23, are provided so that the main and secondary elements are alternately arranged in parallel to one another. The width W_b of the main element 26a, the transmission factor P_b of the main element 26a with respect to the reading light, the width W_c of the secondary element 27a, and the transmission factor P_c of the secondary element 27a with respect to the reading light are determined so that they satisfy a condition equation of $(W_b \text{ X } P_b) / (W_c \text{ X } P_c) \geq 1$.

Imai (Figures 15A-15C) discloses a second conductive layer 5 including a plurality of conductive comb teeth 5a separated by interspaces 5b, a third conductive layer 8 including a plurality of conductive comb teeth 8a separated by interspaces 8b, and an insulating layer 8c interposed between the second conductive layer 5 and the third conductive layer 8. The conductive comb teeth 5a of the second conductive layer 5 extend in the Y-axis direction while the conductive comb teeth 8a of the third conductive layer 8 extend in the Z-axis direction. In other words, the conductive comb teeth 5a of the second conductive layer 5 and the conductive comb teeth 8a of the third conductive layer 8 are arranged in different layers and are perpendicular to one another. Accordingly, Imai does not teach or suggest that the conductive comb teeth 5a (which the Examiner asserts correspond to the claimed main line electrodes) of the second conductive layer 5 and the conductive comb teeth 8a (which the Examiner asserts correspond to the claimed secondary line electrodes) of the third conductive layer are arranged in parallel to one another.

Similarly, it is quite clear that Nelson does not teach or suggest a second electrode layer comprising a plurality of main line electrodes and secondary line electrodes alternately arranged in parallel to one another.

Accordingly, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the electrostatic recording apparatus of Imai to produce the claimed invention in order eliminate a manufacturing step as the Examiner asserts since the applied reference do not teach or suggest main and secondary line electrodes which are alternately arranged in parallel to one another. Moreover, Imai teaches away from forming the conductive comb teeth 5a and 8a in the same layer since forming the conductive comb teeth 5a and 8a in the same layer would not allow the conductive comb teeth 5a and 8a to be arranged perpendicular to one another. Accordingly, Applicant respectfully submits that one of ordinary skill in the would not have been motivated to modify the teachings of Imai to produce the claimed invention for purposes of ease of manufacturing or eliminating a manufacturing step as the Examiner asserts.

In view of the above, Applicant respectfully submits that claims 1-7 should be allowable over Imai, alone or combination with Nelson.

III. New Claims

By this Amendment, Applicant has added new claims 8-10 to further define the claimed invention. Applicant respectfully submits that dependent claims 8-10 should be allowable at least by virtue of their dependency on claim claim 1. Further, Applicant respectfully submits

neither Imai nor Nelson disclose that the width W_b of each of the main line electrodes is different than the width W_c of each of the secondary line electrodes, as recited in claims 8-10.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 2, the first full paragraph is amended as follows:

The applicant of this application has proposed, in Japanese [Unexamined] Patent [Publication] Application Nos. 10 (1998)-271374, 11 (1999)-87922, and 11 (1999)-89553 published as Japanese Unexamined Patent Publication Nos. 2000-162726, 2000-284056, and 2000-284057, respectively, a solid state radiation detector of an optical reading type in which high-speed reading responsivity is compatible with efficient fetching of signal charge from the detector. The detector is constructed of (1) a first electrode layer (conductive layer) which has permeability with respect to recording radiation, or light emitted by excitation of the radiation (hereinafter referred to as recording radiation, etc.), (2) a recording photoconductive layer which exhibits electric conduction when irradiated with the recording light, etc, (3) a charge transfer layer which operates as substantially an insulator with respect to an electric charge of the same polarity as electric charge on the first electrode layer and also operates as substantially an electric conductor with respect to an electric charge of the opposite polarity, (4) a reading photoconductive layer which exhibits electric conduction when irradiated with reading light (electromagnetic waves for reading), and (5) a second electrode layer (conductive layer) which has permeability with respect to the reading light, which are stacked in the recited order. In this type of detector, signal charge (latent image charge) carrying image information is stored in a

charge storage portion formed in the interface between the recording photoconductive layer and the charge transfer layer.

Page 3, the first paragraph is amended as follows:

Particularly, in the above-mentioned [publication] Japanese Patent Application Nos. 11 (1999)-87922 and 11 (1999)-89553, there is proposed a detector where the electrode (light irradiating electrode) of a second conductive layer having permeability with respect to reading light is constructed with a stripe electrode consisting of a large number of main line electrodes. Also, a great number of secondary line electrodes, for outputting an electric signal which has a level proportional to a quantity of latent image charge stored in the charge storage portion, are provided within the second conductive layer so that the main and secondary line electrodes are alternately arranged in parallel to one another.

The paragraph bridging pages 4 and 5 is amended as follows:

The inventors of this application, in the detectors disclosed in the aforementioned [publication] Japanese Patent Application No. 11 (1999)-87922, particularly the detector where the main line electrodes and the secondary line electrodes are provided in the secondary electrode layer so that the main and secondary line electrodes are alternately arranged in parallel to one another, have made various investigations and experiments with respect to the relationship between the transmission factors and areas of the main and secondary line electrodes with

respect to reading light and the magnitude of a quantity of signal charge that can be fetched from the detector, and have found the following relationship therebetween.

Page 10, the second full paragraph is amended as follows:

The method of forming the charge storage portion may employ, for example, a method of forming a charge storage portion in the interface between a charge transfer layer and a recording photoconductive layer (see the aforementioned [publication] Japanese Patent Application Nos. 10 (1998)-27137 and 11 (1999)-87922, filed by the applicant of this application), a method of forming a charge storage portion within a trapping layer or in the interface between the trapping layer and a recording photoconductive layer (see U.S. Patent No. 4535468), or a method of providing micro conductive members on which latent image charge is concentrated (see the aforementioned [publication] Japanese Patent Application No. 11 (1999)-89553, filed by the applicant of this application).

Page 19, the first full paragraph is amended as follows:

And a quantity of signal charge that can be fetched from the detector 20 becomes the same as the sum total ($Q_a + Q_c$) of the quantities (Q_a,Q_c) of positive charge distributed to the capacitors C_{*a} and C_{*c}, and the positive charge distributed to the capacitor C_{*b} cannot be fetched as signal charge (for the details, see the aforementioned [publication] Japanese Patent Application No. 11 (1999)-87922).

The paragraph bridging pages 27 and 28 is amended as follows:

In addition, although in all the detectors of the aforementioned embodiments the recording photoconductive layer exhibits electric conduction when irradiated with the recording radiation, the recording photoconductive layer of the detector according to the present invention is not always limited to this, but may be one which exhibits electric conduction when irradiated with light emitted by excitation of the recording radiation (see the aforementioned [publication] Japanese Patent Application No. 10 (1998)-271374). In this case, a wavelength converting layer, called an x-ray scintillator which converts the recording radiation to light of another wavelength such as blue light, may be stacked on the surface of the first electrode layer. It is desirable that the wavelength converting layer employ, for example, cesium iodide (CsI). It is also desirable that the first electrode layer have permeability with respect to light emitted from the wavelength converting layer by excitation of the recording radiation.

The paragraph bridging pages 28 and 29:

Furthermore, as shown in Fig. 6, in a detector [20] 20d (where an insulating layer 28 having permeability with respect to reading light is interposed between the elements 26a of a main line electrode 26 for light irradiation and the elements 27a of a secondary line electrode 27 for fetching electric charge), proposed in Japanese Patent Application No. 11(1999)-266997, the electrode width and the transmission factor may be set so that they satisfy the above-mentioned condition equation (1) or (2).

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A solid state radiation detector comprising:

a first electrode layer having permeability with respect to recording radiation, or light emitted by excitation of said radiation;

a recording photoconductive layer which exhibits electric conduction when irradiated with said recording radiation or said light;

a reading photoconductive layer which exhibits electric conduction when irradiated with reading light; and

a second electrode layer [constructed of a large number] comprising a plurality of main line electrodes [having permeability with respect to said reading light] and a plurality of secondary line electrodes, wherein said main and secondary line electrodes are alternately arranged in parallel to one another;

said first electrode layer, said recording photoconductive layer, said reading photoconductive layer, and said second electrode layer being stacked in the recited order;

[a large number of] said main line electrodes having permeability with respect to said reading light, said secondary line electrodes[, for] outputting an electrical signal which has a level proportional to a quantity of latent image charge stored in a charge storage portion formed between said recording photoconductive layer and said reading photoconductive layer[, being provided within said second electrode layer so that said main and secondary line electrodes are alternately arranged in parallel to one another];

wherein a width W_b of each of said main line [electrode] electrodes, a transmission factor P_b of each of said main line [electrode] electrodes with respect to said reading light, a width W_c of each of said secondary line [electrode] electrodes, and transmission factor P_c of each of said secondary line [electrode] electrodes with respect to said reading light satisfy a condition equation of $(W_b \text{ X } P_b) / (W_c \text{ X } P_c) \geq 1$.

Claims 8-10 are added as new claims.